General

Guideline Title

ACR Appropriateness Criteria® nontraumatic aortic disease.

Bibliographic Source(s)

Kalva SP, Rybicki FJ, Dill KE, Bandyk DF, Francois CJ, Gerhard-Herman MD, Hanley M, Mohler ER III, Moriarty JM, Oliva IB, Schenker MP, Weiss C, Expert Panel on Vascular Imaging. ACR Appropriateness CriteriaÂ® nontraumatic aortic disease. [online publication]. Reston (VA): American College of Radiology (ACR); 2013. 9 p. [65 references]

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

ACR Appropriateness Criteria®

Clinical Condition: Nontraumatic Aortic Disease

Radiologic Procedure	Rating	Comments	RRL*
X-ray chest	9		☢
CT chest with contrast	8		☢☢☢
CT chest and abdomen without contrast	8		☢☢☢☢
CT chest and abdomen without and with contrast	8		☢☢☢☢
CTA chest with contrast	8		☢☢☢
CTA chest and abdomen with contrast	8		☢☢☢☢
MRA chest without and with contrast	8	See statement regarding contrast in text below under "Anticipated Exceptions."	O
MRA chest and abdomen without and with contrast	8	See statement regarding contrast in text below under "Anticipated Exceptions."	O
US echocardiography transesophageal	7		O

Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate ***Relative**

Radiologic Procedure	Rating	Comments	RRL*
CT chest without and with contrast	7		☢☢☢☢
CT chest and abdomen with contrast	7		☢☢☢☢
MRA chest without contrast	7		O
MRA chest and abdomen without contrast	7	See statement regarding contrast in text below under "Anticipated Exceptions."	O
US echocardiography transthoracic resting	6		O
Aortography chest and abdomen	6		☢☢☢☢
FDG-PET/CT chest and abdomen	5		☢☢☢☢
In-111 WBC scan	5		☢☢☢☢
US intravascular aorta	4		O
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			***Relative Radiation Level**

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Summary of Literature Review

Introduction/Background

Nontraumatic aortic diseases include congenital, inflammatory, infective, metabolic, neoplastic, postoperative, and degenerative disorders that can affect the lumen or aortic wall or both. Such conditions include, but are not limited to, atherosclerosis, aortic dissection, intramural hematoma, penetrating aortic ulcer, aortic aneurysms of various etiologies (degenerative, mycotic, or vasculitis-related), aortic rupture, thrombosis, aortobronchial fistula, congenital disorders, and extrinsic compression from adjacent masses. Imaging studies are required to assess the anatomy and extent of morphological changes to the aortic lumen and aortic wall and, in some cases, functional changes to the aortic valve, branch vessel involvement, and perfusion of the end organs. Often, aortic disorders involve both the thoracic and abdominal aortic segments, thus requiring imaging of both regions. The clinical symptoms of aortic disease vary widely; acute aortic syndrome presents acutely with chest pain and elevated blood pressure, whereas atherosclerosis may be asymptomatic and detected incidentally. The guidelines proposed in this document pertain mainly to acute aortic syndromes, thoracic aortic aneurysm, atherosclerosis, postoperative aorta, and inflammatory or infective disease of the aorta. Readers are encouraged to review published ACR Appropriateness Criteria® for acute chest pain suspected of coronary syndrome, myocardial infarction, pulmonary embolism, aortic dissection, pulsatile abdominal mass, and abdominal aortic aneurysm for intervention planning and follow-up.

Chest Radiograph

A chest radiograph is a useful tool for the initial examination of suspected aortic disease unless the hemodynamic instability precludes its use. It can help rule out other plausible causes of clinical symptoms, and it provides information about the thoracic aorta as well as the heart, lungs, and ribs, which may be involved in aortic disease. The sensitivity of chest radiograph for detecting thoracic aortic disease varies between 12.4% and 81%, but sensitivity differs in whether it is read prospectively or retrospectively. Its sensitivity also depends on the clinical question. The reported sensitivity of chest radiograph in acute aortic syndrome (dissection, intramural hematoma, penetrating aortic ulcer, or nondissecting aneurysm) is as high as 64% for detecting aortic disease, whereas its sensitivity for detecting saccular arch aneurysms is around 50%. Chest radiographs are usually abnormal (sensitivity of 90%) in the presence of thoracic aortic dissection and a normal aorta, and mediastinum decreases the probability of dissection. For obstructive arch disease and vascular rings, chest radiography is useful in diagnosing or ruling out aortic disease. It is also useful in assessing endovascular stent grafts for their integrity (stent fractures, kinking) and displacement. Chest radiography suffers from poor interobserver agreement and lack of sensitivity in assessing the extent of the disease, thus requiring more definitive tests for an accurate diagnosis.

Echocardiography

Transthoracic echocardiography (TTE) and transesophageal echocardiography (TEE) are useful for assessing the heart (for anatomical abnormalities, such as congenital anomalies, intracardiac flow directions, and left ventricular function), pericardium (pericardial effusions and the hemodynamic effects of pericardial effusions), thoracic aorta (mainly the ascending aorta and, to some extent, the proximal descending aorta and arch), and the aortic valve (for presence and quantification of aortic regurgitation); however, TEE is an invasive procedure. For morphological assessment and anatomical mapping of the thoracic aorta, TEE is superior to TTE for diagnosing aortic dissection involving the ascending aorta; it has a sensitivity close to 100% (versus 50% for TTE), which approaches that of computed tomography (CT) and magnetic resonance imaging (MRI). However, when TTE is combined with CT angiography (CTA) with contrast, the sensitivity and specificity increase to the level achieved with either TEE or MRI or a combination of TEE and MRI. TEE is highly sensitive (90%) and specific (99%) for detecting aortic intramural hematoma. Penetrating aortic ulcers affecting the ascending aorta can be easily seen with TEE; however, ulcers affecting the arch are poorly identified. In addition, TEE has prognostic value in patients who have a suspected ascending aortic dissection. During endovascular stent graft placement, TEE is superior to angiography in identifying multiple entries of aortic dissection, assessing stent apposition, and detecting endoleaks. Following surgery for ascending aortic dissection, TEE is useful in assessing anastomotic complications, residual or new dissection, and aortic valve function; it is superior to contrast-enhanced MRI in evaluating periprosthetic valvular thickening. Echocardiography is of limited value in assessing the supra-aortic vessels and abdominal aorta.

Intravascular Ultrasound

Intravascular ultrasound (US) suffers from its invasiveness, limited availability, and dependency on operator skills. Its role in the diagnosis and management of aortic disease is evolving, with reports mainly limited to aortic dissection, intramural hematoma, and penetrating aortic ulcer. It has special value during thoracic aortic endograft placement and is superior to angiography for detecting aortic dissection entry tears, identifying false lumen, involving the branch vessels, and assessing stent opposition and endoleak. US is more sensitive than helical CT in detecting penetrating aortic ulcers. It is also useful in detecting small perigraft pseudoaneurysms that are often not seen on angiography following aortic repair; however, CT and MRI are equally sensitive. Intravascular US is also used to measure the luminal diameter prior to stent graft placement, but its usefulness, when compared with CTA, remains questionable due to the inherent high coefficient of variation in measuring the aortic lumen.

Computed Tomography and Computed Tomography Angiography

CT provides information about the aortic lumen, the aortic wall, and surrounding aortic structures. CT without contrast is often sufficient for assessing the presence and extent of aortic aneurysm, ruptured aneurysm, intramural hematoma, and calcified atherosclerosis. It is also useful in assessing the integrity of a stent graft for fractures, kinking, collapse, and migration. CT is also used to detect other pathologies in the lungs, chest wall, and pleura, which can mimic the symptoms of aortic disease. However, CTA with contrast material can be used to accurately delineate aortic lumen; differentiate the thrombus from flowing blood; identify aortic dissection, penetrating aortic ulcer, and intramural blood pools during the evolution of an intramural hematoma; assess branch vessels and end-organ perfusion; assess anatomic suitability for endograft treatment; and evaluate postoperative aorta for anastomotic pseudoaneurysms, graft diameter, suture dehiscence, residual or new dissection, stent graft integrity, and persistent perfusion of the aneurysm sac following its exclusion by a stent graft, especially with a delayed CTA of 70 to 120 seconds. The sensitivity and specificity of CTA is close to 100% for detecting aortic dissection and intramural hematoma and 93% for detecting branch vessel involvement. CTA provides prognostic information in patients with intramural hematoma because ascending aortic involvement, thickness of intramural hematoma, presence of ulcer-like projections, and aortic size predict complications. CTA can be used to differentiate between atherosclerotic aneurysms and mycotic aneurysms. In cases of a suspected penetrating aortic ulcer, CTA can be used to differentiate a penetrating ulcer from ulcerated plaques and dissection as well as to identify an associated intramural hematoma, pseudoaneurysm, and rupture. Thus, in patients who present with acute aortic syndrome, CTA can provide an accurate diagnosis and help predict the disease progression. However, CT and CTA are limited in evaluating aortic valve function, hemodynamic effects of pericardial effusions, and left ventricular function. Electrocardiograph (ECG)-gated aortic CTA decreases pulsation artifacts of the ascending aorta, allows for a more accurate measurement of the ascending aortic diameter, and potentially increases diagnostic confidence in diagnosing ascending aortic pathology, such as aortic dissection). It may provide information about the aortic root, morphology, aortic valve area and function, and aortic wall elasticity. ECG-gated aortic CTA could be obtained at a low radiation dose (similar to that of nongated CTA).

Magnetic Resonance Imaging and Magnetic Resonance Angiography

Noncontrast MRI of the aorta using double-inversion recovery T1-weighted imaging and balanced steady-state free precession (bSSFP), allows for imaging of the aorta, especially when acquisition is ECG-gated. The accuracy of bSSFP is close to 100% for detecting thoracic aortic aneurysm, dissection, intramural hematoma, and penetrating aortic ulcer when measured against the reference standard of magnetic resonance angiography (MRA) with contrast material. MRI is superior to CT in differentiating an acute intramural hematoma from atherosclerotic plaque and chronic intraluminal thrombus. MRI can also be used to assess the chronicity of an intramural hematoma and can accurately diagnose aortic dissection. Its sensitivity is superior to TTE but comparable to that achieved with CTA and TEE. It accurately measures aortic or graft diameter; evaluates aortic root, periaortic hematoma, and aortic regurgitation; and detects aortic thrombus and entry tear of a dissection. It also is used to evaluate the entire thoracic aorta and its branches. The detection of penetrating ulcers can be limited when using noncontrast MRI; however, its use in detecting an associated intramural hematoma and its extent can be well demonstrated.

Contrast-enhanced MRA techniques have evolved with the introduction of k-space manipulation and short acquisition times with 3-D gradient echo techniques. Double inversion recovery and bSSFP pulse sequences are acquired before applying contrast-enhanced MRA. Additionally, delayed high-resolution, T1-weighted images are acquired to assess the aortic wall enhancement, especially in cases of suspected inflammatory aortic aneurysm, aortitis, or mycotic aneurysm. T2-weighted imaging of the aorta is helpful in assessing vessel wall edema in cases of suspected aortitis. Contrast-enhanced MRA is highly accurate in diagnosing aortic dissection, localizing entry tears, detecting slow flow in the false lumen, and assessing branch vessel involvement, thus providing all the information required for therapy planning. Combined with noncontrast techniques, contrast-enhanced MRA allows for the accurate detection and localization of penetrating aortic ulcers, intramural hematoma, and ulcerated plaques. Following endovascular repair with nitinol-based thoracic endografts, MRA can be used to detect endoleaks, and its sensitivity surpasses that of CTA. MRA clearly shows thickening and enhancement of the aortic wall and is useful in assessing disease activity in patients who have known vasculitis and suspected inflammatory or mycotic aneurysms. Following surgical repair, MRA can detect pseudoaneurysms at the anastomotic sites, graft diameter, dissection recurrence, and aortic root morphology; it can also be used to evaluate the entire thoracoabdominal aorta and supra-aortic branches. Similarly, contrast-enhanced MRA has a higher sensitivity, specificity, and accuracy for detecting obstructive aortic arch anomalies, when compared with TTE and MRI without contrast.

Aortography

The role of aortography in diagnosing aortic disease is decreasing as the availability and higher sensitivities of other noninvasive modalities, such as TTE, CTA, and MRA increases. As expected, aortography remains a part of the interventional procedures for treating aortic disease. Aortography delineates the lumen but provides no direct information about the aortic wall and mural adherent pathology. It has limitations in detecting entry tears, differentiating an atherosclerotic ulcer from a penetrating aortic ulcer, and assessing the extent of mural thrombus. Early reports suggested a similar sensitivity between aortography and contrast-enhanced CT for detecting an aortic dissection, but they noted a higher specificity for aortography. Aortography is useful for diagnosing adult congenital vascular anomalies; however, CTA and MRA provide similar information. Aortography is also useful for assessing postoperative aorta, after surgical and endovascular therapies; however, CT/MRA superseded its use due to their noninvasiveness and higher sensitivity.

Ultrasonography

The role of US is limited to evaluating the abdominal aorta and its branches and extracranial cerebral vasculature. Its role in detecting an abdominal aortic aneurysm is well described in the National Guideline Clearinghouse (NGC) summary ACR Appropriateness Criteria® pulsatile abdominal mass, suspected abdominal aortic aneurysm. US tends to underestimate the size of abdominal aortic aneurysm by 4 mm and may not accurately delineate the margins of the aneurysm and involvement of the visceral branches.

Fluorodeoxyglucose-Positron Emission Tomography

The role of positron emission tomography with fluorine-18-2-fluoro-2-deoxy-D-glucose (FDG-PET) in evaluating aortic disease is evolving. Recent reports have suggested that a higher FDG uptake in patients who have acute aortic syndrome can predict disease progression and future complications. Similarly, its role in assessing disease activity in patients who have large-vessel vasculitis is being investigated. Its sensitivity appears to be low (around 60%) in patients with a low C-reactive protein/erythrocyte sedimentation rate. The additional prognostic value of FDG-PET in these patients is not known, but localization of active disease sites is possible with FDG-PET.

Indium-Labeled Leukocyte Scintigraphy

Indium-labeled leukocyte scintigraphy is useful for assessing infected aneurysms, graft infection, and inflammatory aneurysms. Its sensitivity approaches 90% for detecting mycotic aneurysms. For abdominal aortic graft infection, both contrast-enhanced MRI and indium-labeled leukocyte scintigraphy provide similar negative predictive values, but MRI has a higher positive predictive value and may be more valuable modality.

Summary

- The literature supports the continued use of chest radiography for the initial evaluation of suspected thoracic aortic disease.
- In patients with acute aortic syndromes, CTA without and with contrast provides the most clinically relevant information. CTA is also useful for planning endovascular therapy and postoperative aorta follow-up.
- MRI and MRA provide similar information to that of CTA and are best suited for use with stable patients.

Anticipated Exceptions

Nephrogenic systemic fibrosis (NSF) is a disorder with a scleroderma-like presentation and a spectrum of manifestations that can range from limited clinical sequelae to fatality. It appears to be related to both underlying severe renal dysfunction and the administration of gadolinium-based contrast agents. It has occurred primarily in patients on dialysis, rarely in patients with very limited glomerular filtration rate (GFR) (i.e., <30 mL/min/1.73 m^2), and almost never in other patients. There is growing literature regarding NSF. Although some controversy and lack of clarity remain, there is a consensus that it is advisable to avoid all gadolinium-based contrast agents in dialysis-dependent patients unless the possible benefits clearly outweigh the risk, and to limit the type and amount in patients with estimated GFR rates <30 mL/min/1.73 m^2. For more information, please see the American College of Radiology (ACR) Manual on Contrast Media (see the "Availability of Companion Documents" field).

Abbreviations

- CT, computed tomography
- CTA, computed tomography angiography
- FDG-PET, fluorine-18-2-fluoro-2-deoxy-D-glucose-positron emission tomography
- In-111, Indium-111
- MRA, magnetic resonance angiography
- US, ultrasonography
- WBC, white blood cell

Relative Radiation Level Designations

Relative Radiation Level*	Adult Effective Dose Estimate Range	Pediatric Effective Dose Estimate Range
O	0 mSv	0 mSv
☢	<0.1 mSv	<0.03 mSv
☢☢	0.1-1 mSv	0.03-0.3 mSv
☢☢☢	1-10 mSv	0.3-3 mSv
☢☢☢☢	10-30 mSv	3-10 mSv
☢☢☢☢☢	30-100 mSv	10-30 mSv

*RRL assignments for some of the examinations cannot be made, because the actual patient doses in these procedures vary as a function of a number of factors (e.g., region of the body exposed to ionizing radiation, the imaging guidance that is used). The RRLs for these examinations are designated as "Varies."

Clinical Algorithm(s)

Algorithms were not developed from criteria guidelines.

Scope

Disease/Condition(s)

Nontraumatic aortic disease

Guideline Category

Diagnosis

Evaluation

Clinical Specialty

Cardiology

Nuclear Medicine

Radiology

Thoracic Surgery

Intended Users

Health Plans

Hospitals

Managed Care Organizations

Physicians

Utilization Management

Guideline Objective(s)

To evaluate the appropriateness of initial radiologic examinations for nontraumatic aortic disease

Target Population

Patients with suspected nontraumatic aortic disease

Interventions and Practices Considered

1. X-ray chest
2. Computed tomography (CT)
    - Chest with contrast
    - Chest without contrast
    - Chest without and with contrast
    - Chest and abdomen with contrast
    - Chest and abdomen without contrast
    - Chest and abdomen without and with contrast
3. Computed tomography angiography (CTA)
    - Chest with contrast
    - Chest and abdomen with contrast
4. Magnetic resonance angiography (MRA)
    - Chest without and with contrast
    - Chest without contrast
    - Chest and abdomen without and with contrast
    - Chest and abdomen without contrast
5. Aortography chest and abdomen
6. Fluorine-18-2-fluoro-2-deoxy-D-glucose-positron emission tomography (FDG-PET)/CT chest and abdomen
7. Indium-111 white blood cell (In-111 WBC) scan
8. Ultrasound (US)
    - Intravascular aorta
    - Echocardiography transesophageal
    - Echocardiography transthoracic resting

Major Outcomes Considered

Utility of radiologic examinations in differential diagnosis

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Literature Search Procedure

Staff will search in PubMed only for peer reviewed medical literature for routine searches. Any article or guideline may be used by the author in the narrative but those materials may have been identified outside of the routine literature search process.

The Medline literature search is based on keywords provided by the topic author. The two general classes of keywords are those related to the condition (e.g., ankle pain, fever) and those that describe the diagnostic or therapeutic intervention of interest (e.g., mammography, MRI).

The search terms and parameters are manipulated to produce the most relevant, current evidence to address the American College of Radiology Appropriateness Criteria (ACR AC) topic being reviewed or developed. Combining the clinical conditions and diagnostic modalities or therapeutic procedures narrows the search to be relevant to the topic. Exploding the term "diagnostic imaging" captures relevant results for diagnostic topics.

The following criteria/limits are used in the searches.

1. Articles that have abstracts available and are concerned with humans.
2. Restrict the search to the year prior to the last topic update or in some cases the author of the topic may specify which year range to use in the search. For new topics, the year range is restricted to the last 10 years unless the topic author provides other instructions.
3. May restrict the search to Adults only or Pediatrics only.
4. Articles consisting of only summaries or case reports are often excluded from final results.

The search strategy may be revised to improve the output as needed.

Number of Source Documents

The total number of source documents identified as the result of the literature search is not known.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Strength of Evidence Key

Category 1 - The conclusions of the study are valid and strongly supported by study design, analysis, and results.

Category 2 - The conclusions of the study are likely valid, but study design does not permit certainty.

Category 3 - The conclusions of the study may be valid, but the evidence supporting the conclusions is inconclusive or equivocal.

Category 4 - The conclusions of the study may not be valid because the evidence may not be reliable given the study design or analysis.

Methods Used to Analyze the Evidence

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

The topic author drafts or revises the narrative text summarizing the evidence found in the literature. American College of Radiology (ACR) staff draft an evidence table based on the analysis of the selected literature. These tables rate the strength of the evidence (study quality) for each article included in the narrative text.

The expert panel reviews the narrative text, evidence table, and the supporting literature for each of the topic-variant combinations and assigns an appropriateness rating for each procedure listed in the table. Each individual panel member assigns a rating based on his/her interpretation of the available evidence.

More information about the evidence table development process can be found in the ACR Appropriateness Criteria® Evidence Table Development document (see the "Availability of Companion Documents" field).

Methods Used to Formulate the Recommendations

Expert Consensus (Delphi)

Description of Methods Used to Formulate the Recommendations

Rating Appropriateness

The appropriateness ratings for each of the procedures included in the Appropriateness Criteria topics are determined using a modified Delphi methodology. A series of surveys are conducted to elicit each panelist's expert interpretation of the evidence, based on the available data, regarding the appropriateness of an imaging or therapeutic procedure for a specific clinical scenario. American College of Radiology (ACR) staff distribute surveys to the panelists along with the evidence table and narrative. Each panelist interprets the available evidence and rates each procedure. The surveys are completed by panelists without consulting other panelists. The appropriateness rating scale is an ordinal scale that uses integers from 1 to 9 grouped into three categories: 1, 2, or 3 are in the category "usually not appropriate"; 4, 5, or 6 are in the category "may be appropriate"; and 7, 8, or 9 are in the category "usually appropriate." Each panel member assigns one rating for each procedure for a clinical scenario. The ratings assigned by each panel member are presented in a table displaying the frequency distribution of the ratings without identifying which members provided any particular rating.

If consensus is reached, the median rating is assigned as the panel's final recommendation/rating. Consensus is defined as eighty percent (80%) agreement within a rating category. A maximum of three rounds may be conducted to reach consensus. Consensus among the panel members must be achieved to determine the final rating for each procedure.

If consensus is not reached, the panel is convened by conference call. The strengths and weaknesses of each imaging procedure that has not reached consensus are discussed and a final rating is proposed. If the panelists on the call agree, the rating is proposed as the panel's consensus. The document is circulated to all the panelists to make the final determination. If consensus cannot be reached on the call or when the document is circulated, "No consensus" appears in the rating column and the reasons for this decision are added to the comment sections.

This modified Delphi method enables each panelist to express individual interpretations of the evidence and his or her expert opinion without excessive influence from fellow panelists in a simple, standardized and economical process. A more detailed explanation of the complete process can be found in additional methodology documents found on the ACR Web site (see also the "Availability of Companion Documents" field).

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The recommendations are based on analysis of the current literature and expert panel consensus.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Selection of appropriate radiologic imaging procedures for nontraumatic aortic disease

Potential Harms

Gadolinium-based Contrast Agents

Nephrogenic systemic fibrosis (NSF) is a disorder with a scleroderma-like presentation and a spectrum of manifestations that can range from limited clinical sequelae to fatality. It appears to be related to both underlying severe renal dysfunction and the administration of gadolinium-based contrast agents. It has occurred primarily in patients on dialysis, rarely in patients with very limited glomerular filtration rate (GFR) (i.e., <30 mL/min/1.73 m^2), and almost never in other patients. Although some controversy and lack of clarity remain, there is a consensus that it is advisable to avoid all gadolinium-based contrast agents in dialysis-dependent patients unless the possible benefits clearly outweigh the risk, and to limit the type and amount in patients with estimated GFR rates <30 mL/min/1.73 m^2. For more information, please see the American College of Radiology (ACR) Manual on Contrast Media (see the "Availability of Companion Documents" field).

Relative Radiation Level (RRL)

Potential adverse health effects associated with radiation exposure are an important factor to consider when selecting the appropriate imaging procedure. Because there is a wide range of radiation exposures associated with different diagnostic procedures, a relative radiation level indication has been included for each imaging examination. The RRLs are based on effective dose, which is a radiation dose quantity that is used to estimate population total radiation risk associated with an imaging procedure. Patients in the pediatric age group are at inherently higher risk from exposure, both because of organ sensitivity and longer life expectancy (relevant to the long latency that appears to accompany radiation exposure). For these reasons, the RRL dose estimate ranges for pediatric examinations are lower as compared to those specified for adults. Additional information regarding radiation dose assessment for imaging examinations can be found in the ACR Appropriateness Criteria® Radiation Dose Assessment Introduction document (see the "Availability of Companion Documents" field).

Qualifying Statements

Qualifying Statements

The American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those examinations generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Living with Illness

IOM Domain

Effectiveness

Identifying Information and Availability

Bibliographic Source(s)

Kalva SP, Rybicki FJ, Dill KE, Bandyk DF, Francois CJ, Gerhard-Herman MD, Hanley M, Mohler ER III, Moriarty JM, Oliva IB, Schenker MP, Weiss C, Expert Panel on Vascular Imaging. ACR Appropriateness CriteriaÂ® nontraumatic aortic disease. [online publication]. Reston (VA): American College of Radiology (ACR); 2013. 9 p. [65 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2013

Guideline Developer(s)

American College of Radiology - Medical Specialty Society

Source(s) of Funding

The American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria®.

Guideline Committee

Committee on Appropriateness Criteria, Expert Panel on Vascular Imaging

Composition of Group That Authored the Guideline

Panel Members: Sanjeeva P. Kalva, MD (*Principal Author*); Frank J. Rybicki, MD, PhD (*Panel Chair*); Karin E. Dill, MD (*Panel Vice-chair*); Dennis F. Bandyk, MD; Christopher J. Francois, MD; Marie D. Gerhard-Herman, MD; Michael Hanley, MD; Emile R. Mohler III, MD; John M. Moriarty, MB, BCh; Isabel B. Oliva, MD; Matthew P. Schenker, MD; Clifford Weiss, MD

Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the American College of Radiology (ACR) Web site.

Print copies: Available from the American College of Radiology, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

Availability of Companion Documents

The following are available:

- ACR Appropriateness Criteria®. Overview. Reston (VA): American College of Radiology; 2013 Nov. 3 p. Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.
- ACR Appropriateness Criteria®. Literature search process. Reston (VA): American College of Radiology; 2013 Apr. 1 p. Electronic copies: Available in PDF from the ACR Web site.
- ACR Appropriateness Criteria®. Evidence table development – diagnostic studies. Reston (VA): American College of Radiology; 2013 Nov. 3 p. Electronic copies: Available in PDF from the ACR Web site.
- ACR Appropriateness Criteria®. Radiation dose assessment introduction. Reston (VA): American College of Radiology; 2013 Nov. 3 p. Electronic copies: Available in PDF from the ACR Web site.
- ACR Appropriateness Criteria®. Manual on contrast media. Reston (VA): American College of Radiology; 90 p. Electronic copies: Available in PDF from the ACR Web site.
- ACR Appropriateness Criteria®. Procedure information. Reston (VA): American College of Radiology; 2013 Apr. 1 p. Electronic copies: Available in PDF from the ACR Web site.
- ACR Appropriateness Criteria® nontraumatic aortic disease. Evidence table. Reston (VA): American College of Radiology; 2013. 23 p. Electronic copies: Available from the ACR Web site.

Patient Resources

None available

NGC Status

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